

5 What is claimed is

1. A watercraft steer-by-wire control system comprising:
an input device;
at least one transducer in operable communication with the
input device;
10 a rudder control system in operable communication with the
input device and configured to control a rudder of a watercraft; and
a bow thruster control system in operable communication with
the at least one transducer and configured to control a bow thruster of the watercraft.
- 15 2. The watercraft steer-by-wire control system of claim 1, wherein
the input device is a hand wheel.
3. The watercraft steer-by-wire control system of claim 1, wherein
the input device is configured to have a first degree of freedom and a second degree of
freedom.
- 20 4. The watercraft steer-by-wire control system of claim 3, wherein
the first degree of freedom is a rotational degree of freedom and is configured to
control the rudder direction of the watercraft.
5. The watercraft steer-by-wire control system of claim 3, wherein
the second degree of freedom is a reciprocating degree of freedom and is configured
25 to control the bow thrusting of the watercraft.
6. The watercraft steer-by-wire control system of claim 3, wherein
the second degree of freedom is substantially on a plane that is normal to the input
device and is configured to control the bow thrusting of the watercraft.
7. The watercraft steer-by-wire control system of claim 1, wherein
30 the input device is configured to put the bow thruster into one of two modes, a yaw
mode and a translation mode.
8. The watercraft steer-by-wire control system of claim 7, wherein
when the bow thruster is in the yaw mode, the bow thruster assists in turning the
watercraft in the same direction as the rudder.

- 5 9. The watercraft steer-by-wire control system of claim 7, wherein
when the bow thruster is in the translation mode, the bow thruster assists in translating
the watercraft in the same direction as the rudder.
10. The watercraft steer-by-wire control system of claim 1, wherein
the bow thruster will activate only when the input device is in a thruster control zone.
- 10 11. The watercraft steer-by-wire control system of claim 10,
wherein the thruster control zone is limited by a travel stop of the input device.
12. The watercraft steer-by-wire control system of claim 11,
wherein the travel stop is configured to vary with the watercraft speed.
13. The watercraft steer-by-wire control system of claim 1, wherein
15 the bow thruster will not activate when in a on center zone.
14. The watercraft steer-by-wire control system of claim 10,
wherein the thruster control zone is configured to vary with watercraft speed.
15. The watercraft steer-by-wire control system of claim 1, wherein
the on center zone is configured to vary with watercraft speed.
- 20 16. The watercraft steer-by-wire control system of claim 1, wherein
the bow thruster is configured to apply a force that will push the watercraft in a
direction normal to the stern-to-bow centerline of the watercraft.
17. The watercraft steer-by-wire control system of claim 1, wherein
the bow thruster is configured to apply a force to the watercraft in a range of angular
25 directions.
18. The watercraft steer-by-wire control system of claim 1, wherein
the bow thruster is configured to operate at a constant speed.
19. The watercraft steer-by-wire control system of claim 1, wherein
the bow thruster is configured to operate at a variety of speeds.
- 30 20. A bow thrust input device comprising:
 an input device with a first degree of freedom and a second
 degree of freedom;
 at least one transducer in operable communication with the
 input device; and
35 wherein the at least one transducer is configured to measure
change in the second degree of freedom and transmit a signal to a bow
thruster control system.

- 5 21. The bow thrust input device of claim 20, wherein the first degree of freedom is a rotational degree of freedom.
22. The bow thrust input device of claim 20, wherein the second degree of freedom is a reciprocating degree of freedom.
23. The bow thrust input device of claim 20, wherein the second
10 degree of freedom is substantially on a plane that is normal to the input device.
24. A watercraft control system comprising:
 a bow thrust input device with a first degree of freedom and a second degree of freedom;
 at least one transducer in operable communication with the bow
15 thrust input device and is configured to measure change in the second degree of freedom;
 a bow thruster control system in operable communication with the at least one transducer and a bow thruster; and
 wherein the watercraft control system is configured to convert
20 second degree of freedom movement of the bow thrust input device into a signal that controls the operation of the bow thruster.
25. The watercraft control system of claim 24, wherein the second degree of freedom is a reciprocating degree of freedom.
- 25 26. The watercraft control system of claim 24, wherein the second degree of freedom is substantially on a plane that is normal to the input device.
27. The watercraft control system of claim 24, further comprising:
 a rudder control system in operable communication with the
30 bow thrust input device; and
 wherein the watercraft control system is configured to convert first degree of freedom movement of the bow thrust input device into a signal that controls the operation of a rudder.
28. The watercraft control system of claim 27, wherein the first
35 degree of freedom is a rotational degree of freedom.

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29. A method for maneuvering a watercraft, the method
comprising:

applying a force in a first degree of freedom of an input device;
measuring the movement of the input device in the first degree

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of freedom;

converting the movement into a signal proportional to the
amount of movement; and

transmitting the signal to a bow thruster control system.

30. The method of claim 29 further comprising:

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applying a force in a second degree of freedom of an input
device;

measuring the movement of the input device in the second
degree of freedom;

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converting the movement into a signal proportional to the
amount of movement; and

transmitting the signal to a rudder control system.

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